

AMENDMENT TO THE CLAIMS

1-7. (canceled)

8. (new) A method for controlling and protecting electric motors provided with a rotor, specially permanent magnet motors electronically actuated by a control system, the electric motor comprising poles, the control system comprising position detectors detecting the position of the rotor with respect to the poles of the motor, the method comprising the steps of:

continuously reading the position detector until a minimum expected time has passed and turning off the control system if a position change of the rotor is detected by the position detector, the minimum expected time being started to be counted from the passage of the rotor at a pole of the motor,

after the minimum expected time has passed, continuously reading the position detector until a maximum expected time has passed and turning off the control system if a position change of the rotor is not detected by the position detector with the maximum expected time, the maximum expected time being subsequently counted after the minimum expected time has passed,

if a position change is detected within the maximum expected time, measuring the position of the rotor and actuating the next phase of the motor if the position reached by the rotor is a previously predicted correct position, or turning off the system if the position reached by the rotor is not the previously predicted correct position;

measuring the position of the rotor to detect if one complete turn has been reached, and if a turn of the rotor has been completed, reading the rotation speed of the rotor and calculating a corrected value of the maximum and minimum expected times for the current speed

and afterwards repeating the steps from the step of continuously reading the position detector until a minimum expected time has passed, or

if a complete turn of the rotor has not been completed, repeat the steps from the step of continuously reading the position detector until a minimum expected time has passed.

9. (new) The method according to claim 8, further comprising issuing an error signal:

if until the minimum expected time has passed, a position change of the rotor is detected by the position detector, and

if after the maximum expected time has passed if no position change is detected by the position detector.

10. (new) The method according to claim 9, wherein the maximum expected time has a tolerance of a first head range of half of its value and a second tail range of twice of its value.

11. (new) A control system for an electric motor, especially a permanent magnet motor, the motor comprising poles and a rotor, the control system comprising a three-phase inverting bridge and position detectors detecting the position of the rotor with respect to the poles of the motor, the control system further comprising:

a microcontroller associated with the position detectors and further associated with a counter,

the control system reading the position detectors until a minimum expected time has passed, the minimum expected time being counted by means of the counter after the rotor has passed at a pole of the motor, the control system being turned off if a position change of the rotor

is detected by the position detector within the minimum expected time,

the control system continuously reading the position detector until a maximum expected time has passed and turning off the control system if a position change of the rotor is not detected by the position detector within the maximum expected time, the maximum expected time being counted by means of the counter and subsequently counted after the minimum expected time has passed,

the control system comparing the position changes of the rotor with a previously predicted correct position, to be turned off if the position reached by the rotor is not a previously predicted correct position,

the control system monitoring the position of the rotor to read the rotation speed of the rotor and calculating a corrected value of the maximum and minimum expected times for the current speed after a complete turn of the rotor has been completed.

12. (new) The method in accordance with claim 11 wherein in that the control system is turned off through the error signal.

13. (new) The control system according to claim 11, characterized in that the microcontroller issues an output updating signal to restart the counter after the rotor passes at a correct predicted position.

14. (new) The control system according to claim 13, characterized in that the microcontroller issues an error signal to turn off the control system.

15. (new) An electric motor comprising a control system, the motor comprising poles and a rotor, the control system comprising a three-phase inverting bridge and position detectors detecting the position of the rotor with respect to the poles of the motor, the electric motor additionally comprising:

a microcontroller associated with the position detectors and further associated with a counter,

the control system reading the position detectors until a minimum expected time has passed, the minimum expected time being counted by means of the counter after the rotor has passed at a pole of the motor, the control system being turned off if a position change of the rotor is detected by the position detector within the minimum-expected-time,

the control system continuously reading the position detector until a maximum expected time has passed and turning off the control system if a position change of the rotor is not detected by the position detector within the maximum expected time, the maximum expected time being counted by means of the counter and subsequently counted after the minimum expected time has passed,

the control system comparing the position changes of the rotor with a previously predicted correct position, to be turned off if the position reached by the rotor is not a previously predicted correct position,

the control system monitoring the position of the rotor to read the rotation speed of the rotor and calculate a corrected value of the maximum and minimum expected times for the current speed after a complete turn of the rotor has been completed.

16. (new) The motor according to claim 15, characterized in that the microcontroller issues an

output updating signal to restart the counter after the rotor passes at a correct predicted position.

17. (new) The motor according to claim 16, characterized in that the microcontroller issues an error signal to turn off the control system.

18. (new) A method for controlling and protecting an electric motor provided with a rotor, a permanent magnet, and a control system, comprising position detectors detecting the position of the rotor with respect to poles of the motor, comprising:

reading the position detector until a minimum expected time has passed and turning off the motor if a position change of the rotor is detected by the position detector within the minimum expected time, the minimum expected time being started based on passage of the rotor at a pole of the motor,

after the minimum expected time has passed, reading the position detector until a maximum expected time has passed and turning off the motor if a position change of the rotor is not detected by the position detector within the maximum expected time, the maximum expected time being subsequently counted after the minimum expected time has passed,

if a position change is detected within the maximum expected time, measuring the position of the rotor and actuating the next phase of the motor if the position reached by the rotor is a previously predicted correct position, or turning off the system if the position reached by the rotor is not the previously predicted correct position.

19. (new) The method according to claim 18 further comprising:

measuring the position of the rotor to detect if one complete turn has been reached, and

if a turn of the rotor has been completed, reading the rotation speed of the rotor and calculating a corrected value of the maximum and minimum expected times for the current speed and afterwards repeating the steps from the step of continuously reading the position detector until a minimum expected time has passed.

20. (new) The method according to claim 19, wherein if a complete turn of the rotor has not been completed, repeating the steps from the step of continuously reading the position detector until a minimum expected time has passed.
